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Attorney Docket No. 071815/0478

TO: Assistant Commissioner for Patents
Box Patent Applications
Washington D.C. 20231

BROADENING REISSUE PATENT APPLICATION TRANSMITTAL

INVENTOR(S): **Richard E. SKLAR, Lawrence E. GIRARD, and Ralph P. Phillipp**

Original Patent Number: **5,760,819**

Original Patent Issue Date (month/day/year): **June 2, 1998**

TITLE: **DISTRIBUTION OF A LARGE NUMBER OF LIVE TELEVISION PROGRAMS TO INDIVIDUAL PASSENGERS IN AN AIRCRAFT**

Total Pages: 14

In connection with this application, the following are enclosed:

APPLICATION ELEMENTS:

_X_ Specification, Claims, and Abstract (amended, if appropriate) - 11 pages

_X_ Drawing(s) (proposed amendments, if appropriate) - 3 sheets, Figs. 1-5

_X_ Reissue Oath/Declaration (original or copy) (37 CFR 1.175) (PTO/SB/51 or 52)) - 5 pages

Original U.S. Patent

_X_ Offer to Surrender Original Patent (37 CFR 1.178) (PTO/SB/53 or PTO/SB/54) OR

___ Ribboned Original Patent Grant

___ Affidavit/Declaration of Loss (PTO/SB/55

Original U.S. Patent Current Assigned? _X_ YES ___ NO

(if Yes, check applicable box(es))

____ Written Consent of all Assignees (PTO/SB/53 or 54)

_X_ Assent of Assignee

_X_ 37 CFR 3.73(b) Statement

____ Power of Attorney

ACCOMPANYING APPLICATION PARTS

_X_ Transfer drawings from Patent File with attached 3 sheets of drawings

____ Foreign Priority Claim (35 USC 119) - (if applicable)

____ Information Disclosure Statement(IDS) with PTO-1449. ____ Copies of IDS Citations

____ English Translation Document (if applicable)

____ Preliminary Amendment

__X__ Return Receipt Postcard (MPEP 503)

____ Small Entity Statement(s)

____ Statement filed in prior application, status still proper and desired.

__X__ OTHER: Associate Power of Attorney and Change of Correspondence Address

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FEE CALCULATIONS: including Amendments to claims. (Small entity fees indicated in parentheses.)

(1) For	(2) Number Filed	(3) Number Extra	(4) Rate	(5) Basic Fee $690 ($345)
Total Claims	12	0	x $18 (x $9)	0.00
Independent Claims	4	1	x $78 (x $39)	78.00
			TOTAL FEE:	$768.00

METHOD OF PAYMENT:

__X__ A check in the amount of the above TOTAL FEE is attached. This amount is believed to be correct; however, the Commissioner is hereby authorized to charge any additional fee or credit any overpayment to Deposit Account No. 19-0741.

____ Payment by check is not enclosed. It is requested that the Patent and Trademark Office advise the undersigned of the period of time within which to file the TOTAL FEE.

Respectfully submitted,

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Date: June 1, 2000

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Registration No. 34,649

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Attorney Docket No. 071815/478

In re reissue patent application of

Richard E. SKLAR et al.

Serial No: Not yet assigned

Application for reissue of U.S. Patent No. 5,760,819, granted June 2, 1998

Filed: Herewith

For: DISTRIBUTION OF A LARGE NUMBER OF LIVE TELEVISION PROGRAMS TO INDIVIDUAL PASSENGERS IN AN AIRCRAFT

CERTIFICATE UNDER 37 C.F.R. 3.73(b)

Assistant Commissioner for Patents
Washington, D.C. 20231

Dear Sir:

Rockwell International Corporation, a corporation, certifies that it is the assignee of the entire right, title and interest in the patent application identified above by virtue of either:

A. [ ] An assignment from the inventor(s) of the patent application identified above. The assignment was recorded in the U.S. Patent and Trademark Office at Reel, Frame, or for which a copy thereof is attached.

OR

B. [X] A chain of title from the inventor, of the patent application identified above, to the current assignee as shown below:

1. From: Richard E. Sklar, Lawrence E. Girard, Ralph P. Philipp

To: Hughes Electronics

2. From: Hughes Electronics

Attorney Docket No. 071815/0478

To: Rockwell International Corporation

[ ] Additional documents in the chain of title are listed on a supplemental sheet.

[X] Copies of assignments or other documents in the chain of title are attached.

The undersigned has reviewed all the documents in the chain of title of the patent application identified above and, to the best of undersigned's knowledge and belief, title is I the assignee identified above.

The undersigned (whose title is supplied below) is empowered to sign this certificate on behalf of the assignee.

I here by declare that all statements made herewith of my own knowledge are true, and that all statements made on information and belief are believed to be true; and further, that these statements, and the like so make, are punishable by fine or imprisonment, or both, under Section 1001, Title 18 of United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Date: May 22, 2000

Name: Thomas G. Manor

Title: Assistant Secretary

Signature: Thomas G. Manor

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Attorney Docket No. 071815/478

In re reissue patent application of

Richard E. SKLAR et al.

Serial No: Not yet assigned

Application for reissue of U.S. Patent No. 5,760,819, granted June 2, 1998

Filed: Herewith

For: DISTRIBUTION OF A LARGE NUMBER OF LIVE TELEVISION PROGRAMS TO INDIVIDUAL PASSENGERS IN AN AIRCRAFT

ASSENT OF ASSIGNEE

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

The undersigned assignee of the entire right, title and interest to the United States Letters Patent 5,760,819 hereby assents to the accompanying reissue application and offers to surrender said Letters Patent.

Date: May 22, 2000

Name: Thomas G. Manor

Title: Assistant Secretary

Signature: Thomas G. Manor

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DISTRIBUTION OF A LARGE NUMBER OF LIVE TELEVISION PROGRAMS TO INDIVIDUAL PASSENGERS IN AN AIRCRAFT

BACKGROUND

The present invention relates generally to in-flight aircraft entertainment systems, and more particularly, to a satellite television system that distributes a large number of live television programs to passengers of an aircraft by way of direct broadcast satellite.

The assignee of the present invention manufactures in-flight aircraft entertainment systems, such as an APAX-150 digital passenger entertainment system, for example. The APAX-150 system, along with other commercially available systems, distributes audio and video material to passengers derived from a variety of sources. For example, existing aircraft passenger entertainment systems provide passengers with audio generated from audio tape players, movies derived from video tape players, and interactive services such as games, shopping and telecommunications. With the exception of telecommunication services (air-to-ground telephone calls, etc), all existing services utilize on-board sources (tape players, etc.) to provide the viewable content.

According to polls of airline passengers, there is strong interest in live television programming as an entertainment option. This may include news, sporting events, movies and regular commercial programming. Up to now, each airplane has been a closed, self-contained content provider, in the sense that once off the ground, all entertainment is generated from within the aircraft. This has precluded the offering of live television. Now, with the advance in live broadcast satellite technology, it is possible to provide this desired service to the flying passenger.

An article was published by Jim C. Williams entitled "Airborne Satellite Television" published in the Fourth Quarter 1994 issue of Avion magazine at pages 43 54 that generally describes the concepts of the present invention. Another article in the same magazine entitled "MPEG The Great Enabler" describes MPEG compression technology which is used in the DirectTV digital broadcast satellite system to transmit multiple video and audio channels from a ground station to satellite transponders which relay them to ground-based receivers where they are decoded and displayed. These articles are incorporated herein by reference in their entirety.

The articles provide a description of the digital broadcast satellite system and its operation. The "Airborne Satellite Television" article also describes adapting the digital broadcast satellite system to provide live television broadcasts to aircraft. However, while a description is provided regarding a possible system that could be implemented and the problems that needed to be overcome to implement such a system were discussed, no details of an actual system were provided, such as system or component block diagrams, for example. In fact, the article states that a working system was to be developed in the future. The present invention is such a system.

Accordingly, it is an objective of the present invention to provide for a satellite television system that distributes a large number of live television programs to passengers of an aircraft by way of direct broadcast satellite.

SUMMARY OF THE INVENTION

To meet the above and other objectives, the present invention is a satellite television system that provides live

television programming to passengers using direct broadcast satellite (DBS) services. The present invention combines direct broadcast satellite and audio and video entertainment technologies to provide aircraft passengers with live in-flight television programming. Copending patent application Ser. No. 08/667,222, filed Jun. 19, 1996, entitled "Airborne Satellite Television System" assigned to the assignee of the present invention, describes systems that provide live television programming derived from a direct broadcast satellite system to a passenger aircraft.

The present invention extends the technology disclosed in this copending application to provide distribution of the live television programming within an aircraft to each passenger seat, where each passenger may individually select from among many (approximately 150) channels. Unlike a home environment, where a single person may select from all available programs while viewing only one at a time, the aircraft environment is similar to a large group of individual homes, where each person has a system, including antenna and decoder. In the aircraft, however, it is not practical to duplicate these elements for each passenger. The present invention addresses this problem.

Passengers are desirous of having live television available at their seat. Also, they would like to select from a large number of television programs. A low-cost system described in the above-identified copending patent application, is not suitable for distributing multiple channels to each passenger because the receiver/decoder of this system contains a single circuit to receive and process a single television channel. That system, while suitable for distributing a single channel to a low-cost overhead monitor system, would require as many of these circuits as there are channels to be made available, which are approximately 150 in the case of the DirectTV system. In addition, the video and audio outputs of each of these multitude of circuits would have to be distributed to the passengers individually, a task not practical given the limited bandwidth of the distribution systems installed in commercial aircraft for this purpose.

The present invention provides for a satellite television system that distributes live television service to each passenger without the need to duplicate all of the receiver circuitry. Furthermore, the present invention distributes all television channels of the direct broadcast satellite system to each passenger using currently available aircraft entertainment distribution systems.

More specifically, the satellite television system comprises an antenna that is disposed on the aircraft and pointed at a plurality of satellites that are part of a direct broadcast satellite system. The antenna is controlled by an antenna controller and antenna interface unit that send control signals and process status signals to steer the antenna. The antenna is steered so that it is locked onto RF signals transmitted by the satellites. The antenna interface unit downconverts the received RF signals to provide left hand circularly polarized RF signals and right hand circularly polarized RF signals that contain different sets of television channels. The downconverted RF signals are processed by a single receiver to provide encoded video and audio signals comprising a plurality of television channels. The receiver does not decode or D/A convert the downconverted signals.

The encoded video and audio signals containing the plurality of channels are modulated in a modulator, which also is used as a combiner to modulate signals derived from other video and audio sources, such as video and audio tape players. The modulated and encoded video and audio signals containing the plurality of channels are routed to a video and

audio distribution system that distributes the encoded video and audio signals to each passenger's seat. Seat electronics circuitry is located at each passenger's seat that contains a demodulator, decoder, digital to analog converter and a tuner. The seat electronics circuitry demodulates, decodes and A/D converts the modulated and encoded video and audio signals into signals that may be viewed and heard by the passenger at that seat.

BRIEF DESCRIPTION OF THE DRAWINGS

The various features and advantages of the present invention may be more readily understood with reference to the following detailed description taken in conjunction with the accompanying drawings, wherein like reference numerals designate like structural elements, and in which:

FIG. **1** is a top level block diagram of an embodiment of a satellite television system in accordance with the principles of the present invention that provides live in flight television programming to each passenger on an aircraft;

FIG. **2** is a block diagram of an antenna interface unit employed in the system of FIG. **1**;

FIG. **3** is a block diagram of an antenna controller employed in the system of FIG. **1**;

FIG. **4** is a block diagram of a receiver employed in the system of FIG. **1**; and

FIG. **5** is a block diagram of seat electronics circuitry employed in the system of FIG. **1**.

DETAILED DESCRIPTION

Referring to the drawing figures, FIG. **1** shows a top level block diagram of a satellite television system **10** in accordance with the principles of the present invention. The satellite television system **10** provides live television programming to individual seats of passengers on an aircraft and permits individual selection of channels by passengers.

The satellite television system **10** comprises an antenna **11** that is disposed adjacent the surface of the aircraft. The antenna **11** is pointed at satellites **18**, such as DirectTV satellites **18**, for example, that are part of the existing DirectTV direct broadcast satellite (DBS) system. The antenna **11** is steered so that it is locked onto the RF signal transmitted by the satellite **18**. The antenna **11** is controlled by an antenna controller **17** that sends control signals and processes status signals to and from the antenna **11** by way of an antenna interface unit **12**. However, it is to be understood that the antenna **11** may be an electronically steered antenna **11** or a mechanically steered antenna **11**. The antenna interface unit **12** downconverts received MPEG encoded (compressed) RF signals to provide left hand circularly polarized RF signals and right hand circularly polarized RF signals that contain different sets of encoded television channels. The received encoded (compressed) RF signals are in the 12.2–12.7 GHz band which are downconverted to IF signals in the 950–1450 MHz band.

The downconverted encoded IF signals are processed by a receiver **13**, which does not decode or D/A convert them, to produce encoded video and audio signals corresponding to a plurality of encoded television channels. The encoded (compressed) video and audio signals are modulated by a modulator **19**, which also is used as a combiner, to modulate signals derived from other video and audio sources, such as video and audio tape players. The modulated and encoded video and audio signals are then routed to an in-seat video and audio distribution system **14** which distributes them to each passenger's seat.

Seat electronics circuitry **50** is located at each passenger's seat that contains a demodulator **53**, MPEG decoder **54** and digital to analog converters **55** (described in detail with reference to FIG. **5**). The seat electronics circuitry **50** demodulates, decodes and converts the modulated and encoded video and audio signals into signals that may be viewed and heard by the passenger at that seat by way of a display **51** and head phones **52**. A tuner **57** and game hardware **58** may be provided as part of the seat electronics circuitry **50**.

In operation, the receiver serves to receive IF signal from the antenna **11**, but does not provide MPEG decoding or digital-to-analog conversion processes. The output of the receiver **13**, rather than a baseband video and analog audio output representing a single television program, includes of two serial data streams, one for each polarization. These MPEG-encoded data streams include all of the live television programming provided by the satellites **18**.

The encoded data streams are applied to the RF modulator **19** along with signals from other entertainment sources such as video and audio regarding safety announcements or digital game data, for example. All of these signals are separately modulated and combined onto a single carrier. The resulting signal is distributed to the passengers by means of the in-seat video and audio distribution system **14**, which may be an APAX-150 distribution system made by Hughes-Avicom International, for example.

At each passenger seat or seat group, the signal is processed by the seat electronics circuitry **50** wherein it is demodulated and processed appropriately according to individual signal type. For example, the baseband video and audio from video tape players may be applied to a tuner **57** and converted to a form appropriate for use by the seat's display **51** and the passenger's headphones **52**. Game data is properly processed and applied to game hardware **58** to allow its use by the passenger. In the case of MPEG-encoded live television data streams, the subject of the present invention, the MPEG decoder **54** and digital-to-analog converters **55** located within the seat electronics circuitry **50** process the signals and generate baseband video and analog audio for use by the passengers. Since all television channels received from the satellites **18** are contained within the data streams, each passenger can select any particular channel, without affecting other passengers.

Referring to FIG. **2**, it shows a block diagram of one embodiment of the antenna interface unit **12** employed in the system **10** of FIG. **1**. The antenna interface unit **12** comprises a downconverter **21** that downconverts the RF signals from the 12.2–12.7 GHz band to the 950–1450 MHz band which are output to the receiver **13**. A servo controller **22** is coupled between the antenna controller **17** and the antenna **11**. The servo controller **22** processes antenna position signals to generate elevation motor drive signals that are supplied to the antenna **11**. The servo controller **22** also outputs azimuth control signals to a servo power amplifier **23** that generates azimuth motor drive signals that are supplied to the antenna **11**. Motor position control signals are fed from the antenna **11** to the servo power amplifier **23**. Power is supplied to the antenna **11** by the servo power amplifier **23**. A power supply **24** is provided that converts 115 volt AC power into appropriate DC voltages for the downconverter **21**, the servo controller **22** and the servo power amplifier **23**.

Referring to FIG. **3**, it shows a block diagram of one embodiment of the antenna controller **17** employed in the system of FIG. **1**. The antenna controller **17** comprises a controller **31** which is coupled to an RS485 interface **33** and

an ARINC 429 interface **34**. A power supply **35** is provided that converts 115 volt AC power into appropriate DC voltages for the controller **31**, the RS485 interface **33**, and the ARINC 429 interface **34**. The controller **31** may be an Intel 486 processor, for example. The RS485 interface **33** is coupled between the antenna interface unit **12** and the controller **31** and couples control and status signals thereto. The ARINC 429 interface **34** is coupled between the aircraft navigation system **15** or global positioning system (GPS) **16** and the controller **31** and couples inertial reference signals thereto which is used to accurately steer the antenna **11** toward the satellite **18**.

Referring to FIG. **4**, it shows a block diagram of an embodiment of the receiver **13** employed in the system **10** of FIG. **1**. The receiver **13** comprises a passive mother board **41** which has PCI and ISA busses **46***a*, **46***b*. A DSS PC card **42**, for example, available from Hughes Network Systems and a computer processor **43** are coupled to the PCI bus **46***a*. The DSS PC card **42** and the computer processor **43** contain electronics and software that are substantially identical to a receiver that is used in commercially available DSS systems, such as those made by RCA, for example. Thus, the DSS PC card **42** and the computer processor **43** perform the functions of the receiver **13**. The computer processor **43** has a serial test port **47** that may be used to test the processor **43** and DSS PC card **42**. A flash disk card **44** is coupled to the ISA bus **46***b* and is used to store data and code in a manner similar to a hard disk. A power supply **45** is coupled to the passive mother board **41** and is used to convert **115** volt AC power into appropriate DC voltages for the DSS PC card **42**, the computer processor **43**, and the flash disk card **44**.

Referring to FIG. **5**, it shows a block diagram of one embodiment of the seat electronics circuitry **50** located at each passenger's seat. The seat electronics circuitry **50** includes an MPEG decoder **54**, a demodulator **53**, digital to analog converters **55**, and optional tuner **57** and game electronics circuitry **58**. A power supply **56** is provided that converts 115 volt AC power into appropriate DC voltages for the demodulator **53**, the MPEG decoder **54**, the digital to analog converters **55**, the tuner **57** and the game electronics circuitry **58**. The seat electronics circuitry **50** demodulates, decodes and converts the modulated and encoded video and audio signals into signals that are viewed and heard by the passenger at that seat by way of the display **51** and the headphones **52**.

Thus, a satellite television system that distributes a large number of live television programs to passengers of an aircraft by way of direct broadcast satellite has been disclosed.

Furthermore the present invention also provides for a method of distributing a large number of television programs derived from satellites of a direct broadcast satillite system to each passenger on an aircraft. This is self-evident from, and readily understandable by, those skilled in the art from a reading of the present specification.

It is to be understood that the described embodiment is merely illustrative of some of the many specific embodiments which represent applications of the principles of the present invention. Clearly, numerous and varied other arrangements may be readily devised by those skilled in the art without departing from the scope of the invention.

What is claimed is:

1. A satellite television system that provides a large number of television channels to each passenger on an aircraft derived from direct broadcast satellites, said system comprising:

an antenna that comprises steering means for steering the antenna toward the satellite in response to control signals supplied thereto;

antenna control means for providing the control signals to the antenna and for processing status signals derived from the antenna to steer the antenna so that it is locked onto encoded RF signals transmitted by the satellite, and for downconverting the encoded RF signals to provide encoded left hand and right hand circularly polarized RF signals that correspond to a plurality of encoded television channels;

a receiver coupled to the antenna control means for processing the downconverted encoded RF signals to provide encoded video and audio output signals corresponding to the plurality of television channels, and for feeding back the status signals to the antenna control means which are used to steer the antenna to lock it onto the RF signals received from the satellite;

a modulator coupled to the receiver for modulating the encoded video and audio signals;

a video and audio distribution system coupled to the modulator for distributing the modulated and encoded video and audio signals to each passenger's seat;

seat electronics circuitry coupled to the video and audio distribution system that comprises a demodulator, a decoder and digital to analog converters, and a tuner, for demodulating, decoding and D/A converting the modulated and encoded video and audio signals into signals that may be viewed and heard by a passenger at a seat by way of a display and headphones.

2. The system of claim 1 wherein the modulator comprises a combiner to modulate signals derived from additional video and audio sources.

3. The system of claim 1 wherein the seat electronics circuitry further comprises game electronics for displaying games on the display.

4. The system of claim 1 wherein the antenna control means comprises:

an antenna controller coupled to the receiver for processing status signals derived therefrom; and

an antenna interface unit coupled between the antenna and the receiver for downconverting the RF signals to provide the left hand and right hand circularly polarized RF signals that contain different sets of television channels, and coupled between the antenna controller and the antenna for coupling the control and status signals therebetween.

5. The system of claim 4 wherein the antenna controller comprises:

a controller;

an RS485 interface coupled between the controller and the antenna interface unit for coupling the control and status signals to the controller; and

an ARINC 429 interface coupled between the controller and a navigation system for coupling inertial reference signals provided by the navigation system to the controller which are used to generate steering signals that steer the antenna toward the satellite.

6. The system of claim 5 wherein the antenna interface unit comprises:

a downconverter for downconverting the RF signals received from the antenna and for outputting the downconverted RF signals to the receiver;

a servo controller coupled between the RS485 interface of the antenna controller and the antenna for processing

antenna position signals to generate elevation motor drive signals that are supplied to the antenna, and for outputting azimuth control signals;

a servo power amplifier coupled between the servo controller and the antenna for supplying power to the antenna, and for processing motor position control signals derived from the antenna and the azimuth control signals derived from the servo controller to generate azimuth motor drive signals that are supplied to the antenna.

7. The system of claim 1 wherein the receiver comprises:

a passive mother board having first and second computer busses;

a receiver card coupled to the first computer bus;

a computer processor coupled to the first computer bus; and

a flash disk card coupled to the second bus for storing video, audio and control signals.

8. A method of providing a large number of television channels derived from satellites of a direct broadcast satellite system to each passenger on an aircraft, said method comprising the steps of:

steering an antenna toward the satellites;

downconverting encoded RF signals transmitted by the satellites to provide encoded left hand and right hand circularly polarized RF signals that correspond to a plurality of encoded television channels;

processing the downconverted encoded RF signals to provide encoded video and audio output signals corresponding to the plurality of television channels;

modulating the encoded video and audio signals;

distributing the modulated and encoded video and audio signals to each passenger's seat using a video and audio distribution system;

receiving the modulated and encoded video and audio signals at seat electronics circuitry;

demodulating, decoding and D/A converting the modulated and encoded video and audio signals into signals that may be viewed and heard by a passenger at a seat by way of a display and headphones.

9. The method of claim 8 which further comprises the step of:

generating signals derived from the downconverted encoded RF signals to steer the antenna and lock it onto the RF signals received from the satellites.

* * * * *

--10. A satellite television system that provides television channels to each passenger on an aircraft derived from at least one satellite , said system comprising:

(a) an antenna that comprises a steering device for steering the antenna toward the at least one satellite in response to control signals supplied thereto;

(b) an antenna controller to provide the control signals to the antenna and for processing status signals derived from the antenna to steer the antenna so that it is locked onto encoded RF signals transmitted by the satellite, and for downconverting the encoded RF signals to provide downconverted RF signals that correspond to encoded television channels;

(c) a receiver coupled to the antenna controller to process the downconverted RF signals to obtain encoded output signals corresponding to the television channels;

(d) a modulator coupled to the receiver for modulating the encoded output signals to provide modulated and encoded signals;

(e) a distribution system coupled to the modulator for distributing the modulated and encoded signals to each passenger's seat; and

(f) seat electronics circuitry coupled to the distribution system for demodulating, decoding and D/A converting the modulated and encoded signals into signals that are provided to said each passenger's seat .

11. The system of claim 10, wherein the downconverted RF signals correspond to left hand and right hand circularly polarized downconverted RF signals.

12. A method of providing a plurality of programming channels obtained from at least one satellite, to a plurality of passengers on an aircraft, said method comprising:

steering an antenna towards the at least one satellite;

downconverting encoded RF signals transmitted by the at least one satellite to provide encoded, polarized RF signals that correspond to a plurality of encoded programming channels;

processing the downconverted encoded RF signals to provide encoded video and audio output signals corresponding to the plurality of programming channels;

modulating the encoded video and audio signals;

distributing the modulated and encoded video and audio signals to a plurality of passenger seats;

receiving the modulated and encoded video and audio signals at each of the plurality of passenger seats; and

demodulating, decoding and D/A converting the modulated and encoded video and audio signals into signals that may be viewed and heard by a passenger at a seat.--

ABSTRACT

A satellite television system that provides live television programming to passengers by integrating direct broadcast satellite services into an in-flight aircraft entertainment system. The system has an antenna disposed on the aircraft that is pointed at a plurality of satellites that are part of a direct broadcast satellite system. The antenna is controlled by an antenna controller and antenna interface unit that send control signals and process status signals to steer the antenna. The antenna is steered to lock it onto RF signals transmitted by the satellites. The antenna interface unit downconverts the received encoded RF signals to provide encoded left hand circularly polarized RF signals and right hand circularly polarized RF signals that contain different sets of television channels. The downconverted encoded RF signals are processed by a receiver to provide encoded video and audio signals of different television channels. The receiver does not decode or D/A convert the downconverted signals. The encoded video and audio signals containing the plurality of channels are modulated in a modulator, which also is used as a combiner to modulate signals derived from other video and audio sources. The modulated and encoded video and audio signals are routed to a video and audio distribution system which distributes the encoded video and audio signals to each passenger's seat. Seat electronics circuitry is located at each passenger's seat that contains a demodulator, decoder, digital to analog converters, and an optional tuner. The seat electronics circuitry demodulates, decodes and D/A converts the modulated and encoded video and audio signals into signals that may be viewed and heard by the passenger at that seat.

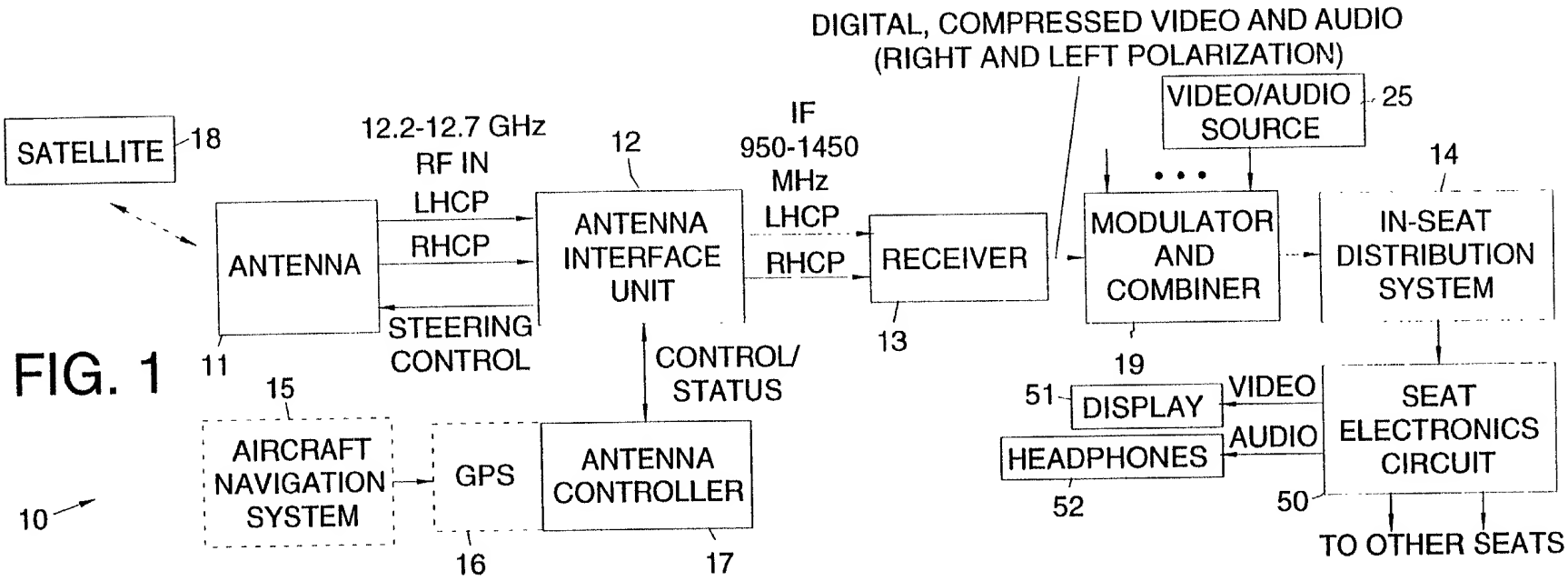
DIGITAL, COMPRESSED VIDEO AND AUDIO
(RIGHT AND LEFT POLARIZATION)
SATELLITE
18
12.2-12.7 GHz
RF IN
LHCP
RHCP
STEERING
CONTROL
ANTENNA
11
12
ANTENNA
INTERFACE
UNIT
IF
950-1450
MHz
LHCP
RHCP
RECEIVER
13
VIDEO/AUDIO
SOURCE
25
MODULATOR
AND
COMBINER
14
IN-SEAT
DISTRIBUTION
SYSTEM
CONTROL/
STATUS
15
AIRCRAFT
NAVIGATION
SYSTEM
GPS
16
ANTENNA
CONTROLLER
17
10
19
51
DISPLAY
VIDEO
AUDIO
HEADPHONES
52
SEAT
ELECTRONICS
CIRCUIT
50
TO OTHER SEATS

FIG. 1

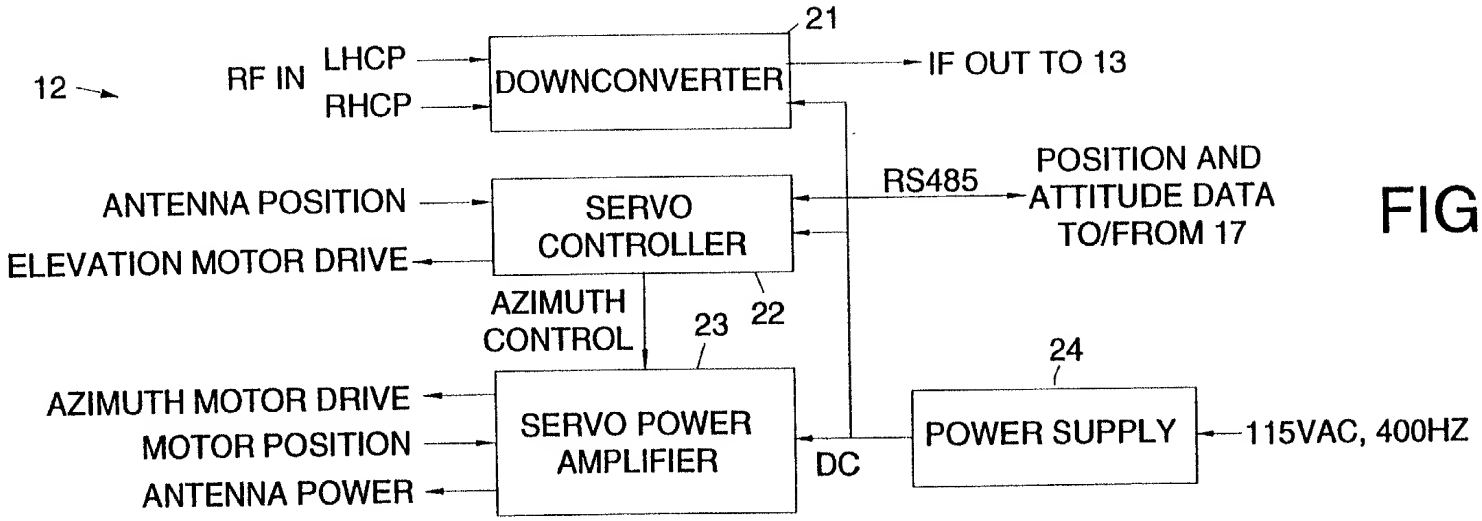
12
RF IN
LHCP
RHCP
21
DOWNCONVERTER
IF OUT TO 13
ANTENNA POSITION
ELEVATION MOTOR DRIVE
SERVO
CONTROLLER
22
RS485
POSITION AND
ATTITUDE DATA
TO/FROM 17
AZIMUTH
CONTROL
23
24
AZIMUTH MOTOR DRIVE
MOTOR POSITION
ANTENNA POWER
SERVO POWER
AMPLIFIER
DC
POWER SUPPLY
115VAC, 400HZ

FIG. 2

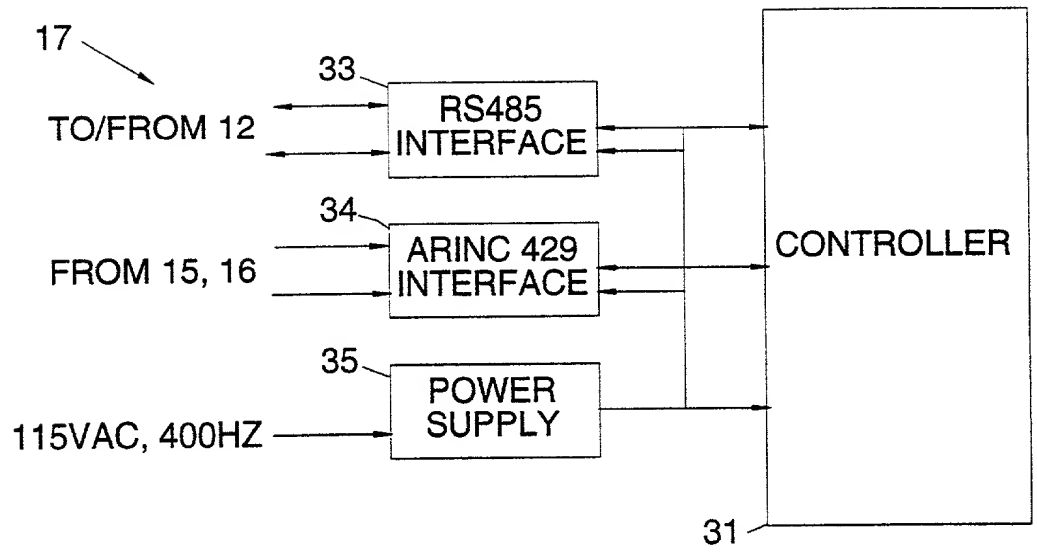
17
33
RS485
INTERFACE
TO/FROM 12
34
ARINC 429
INTERFACE
FROM 15, 16
35
POWER
SUPPLY
115VAC, 400HZ
CONTROLLER
31

FIG. 3

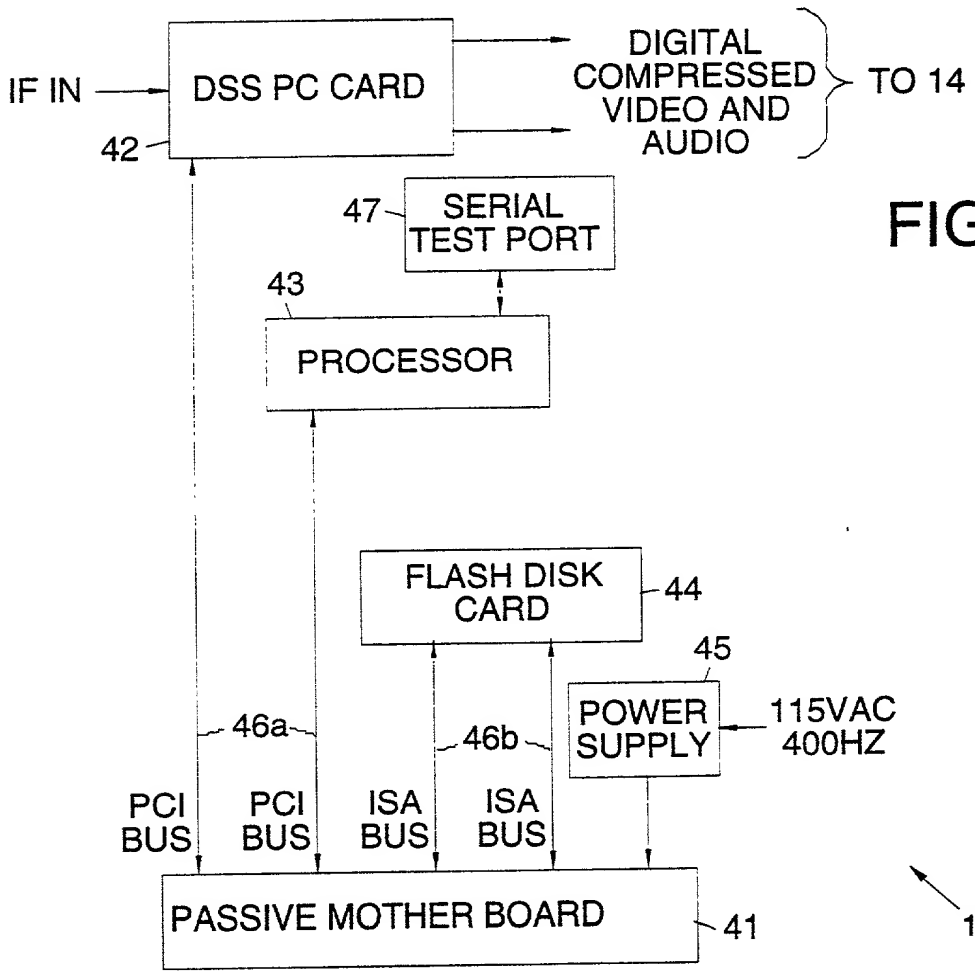
IF IN
DSS PC CARD
42
DIGITAL
COMPRESSED
VIDEO AND
AUDIO
TO 14
47
SERIAL
TEST PORT
43
PROCESSOR
FLASH DISK
CARD
44
45
POWER
SUPPLY
115VAC
400HZ
46a
46b
PCI
BUS
PCI
BUS
ISA
BUS
ISA
BUS
PASSIVE MOTHER BOARD
41
13

FIG. 4

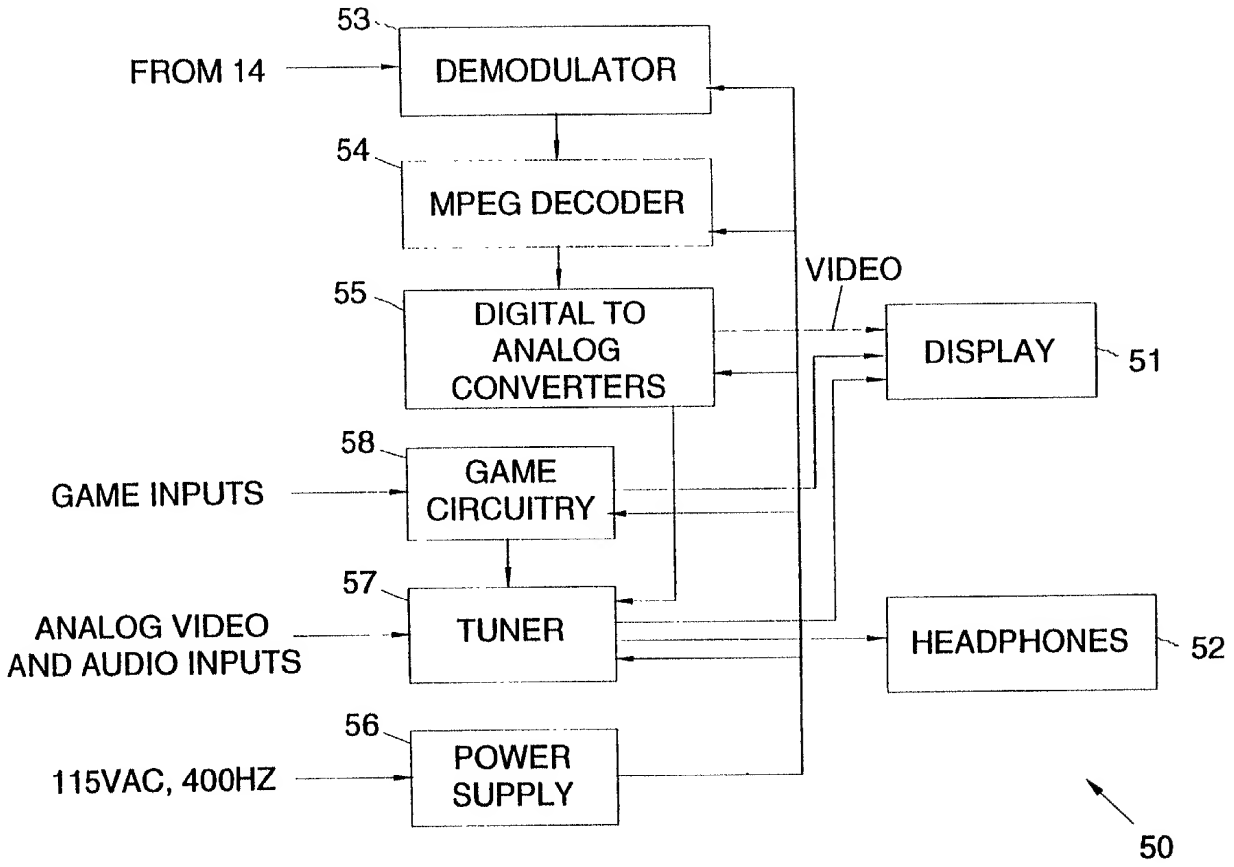
53
FROM 14
DEMODULATOR
54
MPEG DECODER
55
DIGITAL TO ANALOG CONVERTERS
VIDEO
DISPLAY
51
58
GAME INPUTS
GAME CIRCUITRY
57
ANALOG VIDEO AND AUDIO INPUTS
TUNER
HEADPHONES
52
56
115VAC, 400HZ
POWER SUPPLY
50

FIG. 5

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Attorney Docket No. 071815/478

In re reissue patent application of

Richard E. SKLAR et al.

Serial No: Not yet assigned

Application for reissue of U.S. Patent No. 5,760,819, granted June 2, 1998

Filed: Herewith

For: DISTRIBUTION OF A LARGE NUMBER OF LIVE TELEVISION PROGRAMS TO INDIVIDUAL PASSENGERS IN AN AIRCRAFT

BROADENING REISSUE DECLARATION UNDER 37 C.F.R. §1.175

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

We, Richard Sklar, Lawrence Girard, and Ralph Phillipp declare that:

1. Our residence, post office address and citizenship are stated below next to our names.

2. We believe we are the original and first inventors of the subject matter described and claimed in our U.S. Patent 5,760,819 and in the foregoing specification for which a reissue patent is sought on the invention entitled **DISTRIBUTION OF A LARGE NUMBER OF LIVE TELEVISION PROGRAMS TO INDIVIDUAL PASSENGERS IN AN AIRCRAFT.**

3. We have reviewed and understand the contents of the above-identified specification, including the claims.

4. We acknowledge the duty to disclose information which is material to examination of the application in accordance with 37 C.F.R. §1.56(a).

5. There are no foreign applications or inventors certificates having a filing date before that of the applications on which priority is claimed.

6. We believe U.S. Patent No. 5,760,819 ("the '819 patent") is wholly or partly inoperative or invalid by reason of our claiming less than we had the right to claim in the patent.

7. One specific error was for us not to include claims which recite:

(Reissue claim 10) A satellite television system that provides television channels to each passenger on an aircraft derived from at least one satellite , said system comprising:

(a) an antenna that comprises a steering device for steering the antenna toward the at least one satellite in response to control signals supplied thereto;

(b) an antenna controller to provide the control signals to the antenna and for processing status signals derived from the antenna to steer the antenna so that it is locked onto encoded RF signals transmitted by the satellite, and for downconverting the encoded RF signals to provide downconverted RF signals that correspond to encoded television channels;

(c) a receiver coupled to the antenna controller to process the downconverted RF signals to obtain encoded output signals corresponding to the television channels;

(d) a modulator coupled to the receiver for modulating the encoded output signals to provide modulated and encoded signals;

(e) a distribution system coupled to the modulator for distributing the modulated and encoded signals to each passenger's seat; and

(f) seat electronics circuitry coupled to the distribution system for demodulating, decoding and D/A converting the modulated and encoded signals into signals that are provided to said each passenger's seat .

(Reissue claim 11) The system of claim 10, wherein the downconverted RF signals correspond to left hand and right hand circularly polarized downconverted RF signals.

(Reissue claim 12) A method of providing a plurality of programming channels obtained from at least one satellite, to a plurality of passengers on an aircraft, said method comprising:

steering an antenna towards the at least one satellite;

downconverting encoded RF signals transmitted by the at least one satellite to provide encoded, polarized RF signals that correspond to a plurality of encoded programming channels;

processing the downconverted encoded RF signals to provide encoded video and audio output signals corresponding to the plurality of programming channels;

modulating the encoded video and audio signals;

distributing the modulated and encoded video and audio signals to a plurality of passenger seats;

receiving the modulated and encoded video and audio signals at each of the plurality of passenger seats; and

demodulating, decoding and D/A converting the modulated and encoded video and audio signals into signals that may be viewed and heard by a passenger at a seat.

9. By this reissue declaration, we desire to seek broadened claims, and, this application for reissue of the original Letters Patent addresses the aforementioned errors in claiming less than we were entitled to claim by including new independent claim 10 which does not specify an unnecessary feature in claim 1 of feeding back status signals using a receiver/decoder, by adding new dependent claim 11 that further defines the downconverted RF signals, and by adding new independent claim 12 that does not specify an unnecessary feature in claim 9 of using a display and headphones and that describes the encoded signals as being left hand and right hand circularly polarized signals. Support for the above amendments and new claims exist in Figure 1 of the Letters Patent and the accompanying description of that figure in the specification.

10. We believe that the errors recited above and being presented for correction in this reissue application arose without any deceptive intention on our part.

WHEREFORE, We pray that we may be allowed to surrender the original Letters Patent 5,760,819 and do hereby offer same.

We hereby appoint Stephen A. Bent, Reg. No. 29,768; David A. Blumenthal, Reg. No. 26,257; William T. Ellis, Reg. No. 26,874; John J. Feldhaus, Reg. No. 28,822; Patricia D. Granados, Reg. No. 33,683; John P. Isacson, Reg. No. 33,715; Peter G. Mack, Reg. No. 26,001; Brian J. McNamara, Reg. No. 32,789; Sybil Meloy, Reg. No. 22,749; George E. Quillin, Reg. No. 32,792; Colin G. Sandercock, Reg. No. 31,298; Bernhard D. Saxe, Reg. No. 28,665; Charles F. Schill, Reg. No. 27,590; Richard L. Schwaab, Reg. No. 25,479; Harold C. Wegner, Reg. No. 25,258, Johnny A. Kumar, Reg. No. 34,649, Phillip J. Articola, Reg. No. 38,819, Joseph N. Ziebert, Reg. No. 35,421, and Kyle Eppele, Reg. No. 34,155, as our attorneys with full power of substitution and revocation to prosecute this application and to transact all business in the U.S. Patent and Trademark Office connected herewith, and request that all correspondence be sent to FOLEY & LARDNER, 3000 K Street, N.W., Suite 500, Washington, DC 20007-5109 at (202) 672-5300.

The undersigned petitioners declare further that all statements made herein of their own knowledge are true, and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Richard E. Sklar

Signature: Richard E. Sklar *Date:* 15 MAY 2000

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Lawrence E. Girard

Signature: Lawrence E. Girard *Date:* 19 May 2000

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Post Office Address: WESTMINSTER 92683 *Citizenship:* US

Ralph P. Phillipp

Signature: Ralph P. Phillipp *Date:* 5/19/2000

Residence:
16062 DAVIS LANE

Post Office Address: Huntington Beach, CA *Citizenship:* USA

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Attorney Docket No.: 071815/0478

In re patent application of:

Richard E. SKLAR et al.

Serial No.: Not yet assigned

Application for reissue of U.S. Patent No. 5,760,819, granted June 2, 1998
Filed: Herewith

For: **DISTRIBUTION OF A LARGE NUMBER OF LIVE TELEVISION PROGRAMS TO INDIVIDUAL PASSENGERS IN AN AIRCRAFT**

ASSOCIATE POWER OF ATTORNEY AND CHANGE OF CORRESPONDENCE ADDRESS

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

The undersigned officer of Rockwell International Corporation hereby grants the following attorneys/agents associate power to prosecute the above-identified application and transact all business in the Patent and Trademark Office connected therewith:

Johnny A. Kumar, Reg. No. 34,649; Phillip J. Articola, Reg. No. 38,819; Joseph N. Ziebert, 35,421; other members of the law firm of Foley and Lardner; and Kyle Eppele, Reg. No. 34,155, of Rockwell International Corporation.

It is requested that all future correspondence be mailed to:

Kyle Eppele
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Intellectual Property Division
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Cedar Rapids, Iowa 52498

Respectfully submitted,

Date: May 22, 2000

Name: Thomas G. Manor

Title: Assistant Secretary

Signature: Thomas G. Manor